

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 60945

Wednesday, July 28, 2010 1:12:39 PM



Page 2

Item ID: D6104-011

Accept



Setup Start



Revision ID:

Stop



Item Name: 17-4 SS Roundbar 6.50"OD

Start Date: 7/28/2010 Start Qty: 5.00



Cust Item ID:

Required Date: 8/6/2010 Req'd Qty: 5.00



Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130



Packaging

Identify as per dwg & Stock Location: *MAT*

0.00

amb 10/08/19

Memo

0.00

*5**Ø*

Packaging

140



QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

Memo

0.00

*10/08/19**CL10/8/19*

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NOTE: Date & initial all entries

Picklist Print

Wednesday, July 28, 2010 1:18:39 PM

Page 1

Work Order ID: 60945

Parent Item: D6104-011

Parent Item Name: 17-4 SS Roundbar 6.50"OD





Start Date: 7/28/2010

Required Date: 8/6/2010

Start Qty: 5.00

Required Qty: 5.00

Comments: IPP A ☐ 02.12.02 ☐ New Issue ☐ KJ/RF ☐

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6104-011P  17-4 SS Roundbar 6.50"OD		Purchased	No			110	Each	0.0000	1	5			
												CG 10/8/17	(5)

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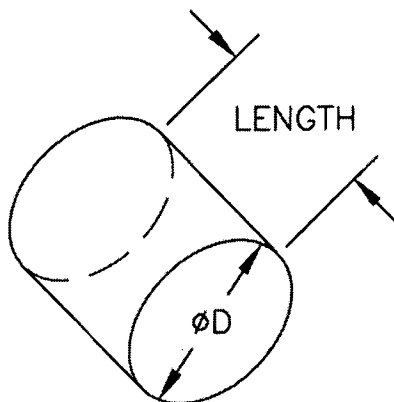


DESIGN <i>[Signature]</i>	DRAWN BY <i>[Signature]</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D6104	Rev. B SHEET 1 OF 1
DATE 02.11.25		TITLE ROUND BILLET, 17-4	SCALE NTS
A	01.04.10	NEW ISSUE	
B	02.11.25	CLARIFY ALLOY SPEC ADDED D6104-009/-011 REDUCE LENGTH OF BILLETS	

RELEASED

02.11.29 *[Signature]*

SPECIFICATION CONTROL DRAWING



SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 60945

2810-728

MATERIAL: 17-4 PH SS (AMS 5643 OR AISI 630) MIN UTS = 170 KSI (38 HRC)

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, DIAMETER x LENGTH (+0.030/-0.000) AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.030/-0.000.

ALL DIMENSIONS ARE IN INCHES

Part No.	Alloy	D (Diameter)	Length
D6104-001	17-4 PH STAINLESS STEEL	Ø3.00	3.80
D6104-003	17-4 PH STAINLESS STEEL	Ø3.25	3.80
D6104-005	17-4 PH STAINLESS STEEL	Ø4.00	5.10
D6104-007	17-4 PH STAINLESS STEEL	Ø4.50	5.10
D6104-009	17-4 PH STAINLESS STEEL	Ø5.25	4.10
D6104-011	17-4 PH STAINLESS STEEL	Ø6.50	4.10

mf
10/6/19

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NOTE: Date & initial all entries

**Castle Metals®**

A. M. Castle & Co.

PACKING SLIP

Page 1 of 1

Shipment No:451392

Ship From: Castle Metals MONTREAL 835-SELKIRK AVENUE POINTE CLAIRE, QUEBEC H9R 3S2		Sold To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7		Ship To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7		Deliver To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA	
Date Shipped 16-AUG-10	F.O.B. ORIGIN	Freight Terms Prepaid		Carrier LOCAL FLEET		BOL No 451392-4	

Shipment Details	Final Destination Branch - MON
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Order No	Line No	Item No	Description				
906954	2	15003.MO	6.5000.RD.17CR-4NI.STAINLESS.RT.SOL TR.COND A.120.0000-168.0000 CUT TO 4.1 IN (+ 0.30/- .0000 IN) - BAND SAW CUTTING SPECIFICATIONS: AMS-5643				
Purchase Order No		Part Number		Ordered Qty		Invoice Qty	
12345				5 PCS		5 PCS	
Details							
Delivery No.	Mill	Heat Number	Mech Id	PCS	Width (IN)	Length (IN)	Shipped Qty (LBS)
38359300		G16343		5			200.23

These commodities/technologies are subject to US Export Administration & US State Dept. Regulations and, if intended for export, were/are exported thereunder. Diversion contrary to US Law is Prohibited.

We hereby certify the material covered by this certification conforms in accordance with the above specifications and has been found to meet the applicable requirements for the material, including any specifications forming a part of the description. Test reports are on file subject to examination. All claims for defective material are waived unless made in writing to A.M. Castle & Co. within 60 days of the shipment. Material cut to the correct size, or material cut by the customer cannot be returned for credit.

Reviewed by Authorized Castle Metals Representative:

Date:

cmk
10/08/17

SCOT FORGE



8001 Winn Rd., Box 8
Spring Grove, IL 60061
847/587-1000
FAX 847/587-2000

H00160 3 SS
Heat # G16343

PO # 49893 MATERIAL CERTIFICATION

Page 3 of 3

CASTLE METALS

Material Cert Number 666343 m1019R0
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Compliance Statements:

The products supplied are in compliance with the quantity and quality requirements of the purchase order and specifications noted. The test reports represent the actual attributes of the items furnished and the test results are in full compliance with all applicable specifications and order requirements.

CASTLE METALS - CLE	
HEAT NUMBER	G12343
MECHANICAL ID	
ITEM CODE	T5003
LOT NUMBER	
PO NUMBER	
RECEIPT DATE	5-26-10
SUPPLIER	
LCS	
COMMENT	
APPROVED	<i>[Signature]</i>

[Signature]
10/08/19

Note: The recording of false, fictitious or fraudulent statements or entries on this document may be punishable as a felony under Federal Statute.

Approved by:

[Signature]
Jerry Glossinger
Corporate Quality Assurance Manager

SCOT FORGE



8001 Winn Rd., Box 8
Spring Grove, IL 60061
847/587-1000
FAX 847/587-2000

PO # 49893 MATERIAL CERTIFICATION

H00160 3 SS
Heat # G16343

Page 1 of 3

S O L O D	CASTLE METALS 3400 N WOLF RD FRANKLIN PARK, IL 60131-1319	Shipping Information	Material Cert Number
			666343 m1019R0
			Revision Date
			05/25/2010

Item 1 of 1	
Material	Castle Metals Specification 3174-02 Rev:28, ASME SA-564 Type 630 Cond"A" 2007 Edition 2008 Addenda ASTM A 564-04 Type 630 Condition "A", AMS 5643R Condition "A", AMS 2303E, UNS# S17400
Heat Treat	per Specification
Destructive Test	per Specification
Finish	Rough Machine with allowance to finish allowing .063" to .083" stock on diameter
Reference	Access Code: 15003
Size	OD Random Len (inches) 6.5 108 to 156
Surface	500 RMS

Heat Number	# of Pieces	(MILL - UNIVERSAL STAINLESS)
G16343	2	MSDS Previously Sent

Note: Additional prefix letter stamped on product with heat number is for our inventory purposes only and not relevant to heat number.

Chemical Composition (Wt. %)

C	Mn	P	S	Si	Ni	Cr	Mo	Cu	Al	V
0.032	0.79	0.022	0.003	0.37	4.77	15.32	0.22	3.32	<0.01	0.06
Cb	N	Ta	B	Co	Sn	Ti	W			
0.26	0.024	<0.01	0.001	0.05	0.005	<0.01	<0.05			
Cb+Ta										
0.27										

Mechanical Properties:

Pcs	Tensile PSI	Yield ¹ PSI	Elongation %	Reduction of Area %	Comments
1	193,288	173,305	13.7	41.9	LONGITUDINAL

¹(Offset: .2%)

Rockwell Hardness Results:

Pcs	Rockwell "C"
1	42

[Signature]
10/08/19

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Approved by:

[Signature]
Jerry Glassinger
Corporate Quality Assurance Manager



CASTLE METALS

Material Cert Number
666343 m1019R0

Brinell Hardness Results:

Pcs	3000 Kg Load
1	302
1	321

Other Testing or Inspections:

Solution anneal at 1900 degrees F for 6.25 hours
Age at 905 degrees F for 1 hours

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE UNITED STATES

QUENCH MEDIA - POLYMER
QUENCHANT 123 DEGREES F AT START OF QUENCH
QUENCHANT 126 DEGREES F AT END OF QUENCH

16.5:1 FORGING REDUCTION FROM ORIGINAL INGOT

CAST METHOD - INGOT

NO WELD REPAIRS PERFORMED

MICRO EXAM PERFORMED PER AMS 2315 WITH RESULTS OF <5% DELTA
FERRITE OBSERVED

MACRO ETCH PERFORMED PER ASTM E340 WITH RESULTS OF NO PIPE,
CRACKS, POROSITY, ETC

FREQUENCY = .00 SEVERITY = .00 PER AMS 2303

AIR COOLED AFTER AGE

Compliance Statements:

We certify that the material listed was not processed with mercury bearing instruments and/or equipment which might cause contamination, nor was mercury handled in the immediate vicinity during the manufacturing process. We also certify that the material was not processed or cleaned with low melting point materials as alloying constituents, i.e. lead, zinc, cadmium, tin, antimony, bismuth, sulfur, or their compounds.

In accordance with the requirements of the Pressure Equipment Directive, all testing, inspection, and documentation is produced in accordance with EN 10204:2004 Type 3.1 and ISO 10474 Type 3.1.B

Material provided has been produced by Scot Forge under an approved quality program as defined within the Scot Forge QA Manual, Revision 2, Dated 10/05/09.

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Approved by:

Jerry Glessinger
Corporate Quality Assurance Manager